DIVISION 1 – GENERAL REQUIREMENTS

Section 1-1 Statement of Work

PART 1 - GENERAL

1-1.1 Project Location
Grand Junction Airport, Walker Field, Runway 11 MALSR towers, 39-08-12 N / 108-32-49 W. FAA escort is required.

1-1.2 Scope
This project replaces the existing MALSR towers, Stations 4+00, 6+00, 8+00, 10+10, 12+20, 14+10, 16+00, 18+00, 20+00 and 22+00 as shown on the drawings, at Walker Field Airport, Grand Junction, CO. The towers are located on the Airport clear zone. Contractor shall furnish all material, equipment and labor to perform this work in accordance with the construction specifications, drawings and referenced standards. Items listed as government furnished material (GFM) will be provided to Contractor by FAA.

1-1.3 Scope and Sequence of Work. Work includes, but is not limited to the following, in accordance with this specification and project drawings:

a. Disconnect electrical service at disconnect switch, Station 14+10. Lock out switch for duration of construction.

b. Remove existing towers from concrete pads. Remove from vicinity and dispose off site.

c. Demolish and remove existing concrete pads.

d. Construct new foundation pads according to tower type.

e. Install new towers on concrete pads. Cut and assemble tower structures to correct light plane elevation as shown on the drawings. See drawings for general assembly instructions.

f. Connect electrical service to new towers. Install power service conduits as required to service relocated towers.

g. Ground towers to EES.

h. Grade area around towers and provide crushed rock pad.

Prior to construction, FAA will identify, to the best of their ability, the location of all underground cables and grounding systems. The Contractor shall make the necessary arrangements with an underground cable/utility location service to locate any other utilities that may be located within the construction area. The Contractor shall repair or replace, at his expense, any damage to any existing cables that is caused by the Contractor's operations. All necessary repairs shall be performed per FAA-C-391b, Section 3.8.

Upon completion, the new MALSR towers shall be complete and ready for use by FAA.

1-1.4 Compliance with Local and Other Codes. Contractor shall comply with local and other codes and standards (e.g. National Electrical Code) adopted by the contract documents. Where the requirements of the construction plans and specifications exceed those of local and adopted codes, the Contractor shall comply with the requirements of the construction plans and specifications.

1-1.5 Local Permits. Contractor shall apply and pay for local electrical permits and inspections as required.

1-1.6 Preconstruction Conference.
Contractor representative shall attend a preconstruction telephone conference prior to beginning work to coordinate work procedures with FAA, Airport personnel and Pacific Power and Light personnel. Contractor shall abide by all requirements imposed such as ingress and egress routes, airport security, deference to aircraft traffic, and general operating procedures.

1-1.7 Schedule of Work
The Walker Field MALSR landing aid has a scheduled outage beginning on **7:00 am PDT, Monday, June 9, 2008 and ending 5:00pm PDT, Sunday, June 23,** inclusive. The Contractor shall complete the entire work ready for use within this scheduled outage.

This schedule permits FAA technicians sufficient time to complete the testing of the MALSR lighting before returning the MALSR to service.

Contractor shall submit schedule of work at the preconstruction conference for review by the Engineer. Any change to work schedules shall be coordinated with the Engineer.

1-1.8 Job Conditions
Coordinate with SSC technicians and the Airport to determine access requirements. Contractor shall comply with requirements regarding airport security, deference to air traffic, and general operating procedures.

1-1.9 Government Furnished Material (GFM)
The following material will be provided by the Government at the sites:

- 13'-11" MG-20 tower, RAIL
- 14'-11" MG-20 tower, RAIL
- 21'-1" MG-20 tower, RAIL
- 26'-11" MG-30 tower, RAIL
- 31'-11" MG-40 tower, TM
- 33'-11" MG-40 tower, TM
- (3) 40'-0" MG-40 towers, TM
- 36'-11" MG-40 tower, TM
- 35'-11" MG-40 tower, TM
- 21'-1" MG-tower, TM
- (4) T-1 crossbar & junction box, RAIL
- (8) TM crossbar, complete
- (4) MG-20 anchor bolt sets
- (8) MG-30 anchor bolt sets
- Epoxy kit
- Lift device
- Jack assembly

1-1.10 Temporary Facilities
Contractor shall provide and pay for any temporary services or facilities specified below. Contractor shall remove facilities when no longer in use.

a. Contractor shall be prepared to provide a portable electrical generator for power tools as needed (such as concrete vibrators).

b. Contractor shall be prepared to provide shelter sufficient to provide a temperature of 62 degrees Fahrenheit or higher for 24 hours to cure the epoxy on the MG-20 towers.

c. Contractor shall provide water necessary for construction and drinking. See CFR 29 Part 1926.51 Sanitation.

d. Contractor shall provide a temporary sanitary toilet for worker use as necessary. Maintain and service toilet properly. Secure toilet to prevent overturning.

1-1.11 Coordinating and Expediting

Contractor shall coordinate and expedite all phases of work specified in this contract including subcontracted portions of the work.

1-1.12 Safety Precautions

a. Contractor shall coordinate all work with Resident Engineer and Airport manager. Airport manager, through the FAA, reserves the right to suspend Contractor's operations if work activities constitute a danger to aircraft or airport operations.

b. Contractor shall explain all safety control procedures required on the airport to all workmen and any subcontractors.

c. During the contract, runways, taxiways and aprons will remain in use by aircraft. Contractor shall to observant of all air traffic and defer to same. Contractor shall use extreme caution to avoid endangering or impeding airborne aircraft or aircraft on runways, taxiways, or aprons. Aircraft operations have priority over all Contractor activities.

d. All Contractor materials and equipment shall be secured so they do not present a foreign object damage (FOD) threat to aircraft operating on, to, or from the airfield. All Contractor materials and equipment, including packaging and coverings, must be secure from being dislodged/carried by winds while on site.

e. All Contractor equipment will be marked with orange and white checkered flags not less that 3 square feet during the day (21" x 21" or larger). At night, equipment shall be marked by amber flashing electric strobe or 360^{o} rotating lights. Personal vehicles will not generally be allowed on airport operations area.

f. Contractor shall provide all radio communication equipment to control vehicles and personnel involved with construction activity. Inside the AOA, Contractor shall designate one person responsible to monitor the airport Unicom frequency and visually scan for approaching aircraft.

g. Contractor shall backfill excavations the same day unless permitted by the Engineer and protected by barricades and marked by appropriate warning lights.

1-1.13 Damage to the Site

All cost of repairs shall be paid by the Contractor. After notice to proceed and prior to the commencement of construction, the contractor and the Resident Engineer shall conduct joint inspections of the existing areas affected by the construction. Damage or defects shall be noted and will be used as the basis for determination of damages caused by the Contractor's operations.

1-1.14 Protection of Existing utilities, vegetation, Structures and Improvements
This item shall also apply to roadway, shoulders, slopes, culverts, guard posts, fencing, gates, etc. Where such items are disrupted or damaged, they shall be repaired or replaced at the Contractor's expense.

1-1.15 Protection and Clean-up
The Contractor shall have the overall responsibility for the performance and enforcement of all forms of protection against the weather, and further the responsibility for repair and replacement of material or equipment damaged as a result of inadequate protection. Upon completion of the work, Contractor shall remove from the site all surplus material and equipment belonging to his forces or subcontractors. All rubbish resulting from work shall be removed from the site by the Contractor daily.

1-1.16 Warranty
Contractor shall warranty all work performed and materials furnished for one year from final acceptance against latent defects, inferior materials, and poor workmanship. Upon receipt of Government notice that work, material, or equipment furnished under the contract has failed to meet the warranty, Contractor shall promptly correct all defects and restore any damage caused by correcting defects.

1-1.17 Submittals Provide for approval manufacturer's specifications for any product proposed as equal to materials specified.

1-1.18 Shop Drawings Not required.

1-1.19 As-Built Drawings
Contractor will maintain two sets of red-line as built drawings on site, marked to show deviations from the drawings. Resident engineer will verify that drawings are accurate and complete. As-built drawings shall show locations of underground utilities revealed during construction. One set of redlines will be retained on-site by the SSC at completion of work, and one set will be retained by the Contracting Officer's representative. When completed, final record as-built drawings will be filed in the Western Service Area office. Engineering Services will provide 11 x 17 hard copies to TSC and SSC.

1.2 Project Work Hours
Contractor will be able to work 40 hours per week. Contractor shall provide a schedule at the prework meeting. Work hours in the construction area will be restricted to 7:30 a.m. to 5 p.m. daily, Monday through Friday, excluding Federal holidays. Work hours other than as specified above shall be coordinated with and approved by the Contracting Officer's representative.

1.3 Safety

A. **Construction** – Contractor shall observe OSHA safety standards. OSHA General Industry Safety and Health Standards (29 CFR 1910), OSHA Construction Industry Standards (29 CFR 1926 apply.

B. **Risk Management Plan** – Engineer will provide a risk management plan to identify potential risk to the National Airspace System and indicate mitigation required.

C. **Spill Kit –** No special spill kit required.

1-4 Contract Acceptance Inspection (CAI)
The Resident Engineer will conduct a final inspection at the conclusion of work. Contractor superintendent will be present. Contractor will expediently correct discrepancies in work as noted in the CAI report.

DIVISION 02200 – SITE WORK AND DEMOLITION

Part 1 – General

02200-1.1 Scope

Contractor shall perform the following demolition work:

a. Remove and dispose of ten existing MALSR towers, which consist of aluminum tubing, elevations as indicated on the MALS Plan & Profile drawing. Save the lights for reinstallation by FAA personnel.

b. Demolish and dispose of existing concrete footings as required to install new footings. Existing footings at Stations 14+10 and 16+00 may be abandoned in place after removing anchor bolts.

c. Excavate for new tower footings. Where excavation is carried to a depth greater than required, backfilling with earth will not be permitted. In such instances, backfilling shall be done with concrete at no additional cost to the Government.

d. Take care not to damage existing underground conduit and wiring.

Typical Footing of Tower to be Demolished

Typical Tower with Crossbar to be Demolished.

Typical Flasher Tower to be Demolished.

DIVISION 02300 – CONCRETE

Part 1 – General

02300-1.1 Scope
Contractor shall provide concrete footings for new LIR structures.

02300-1.2 Concrete Formwork

a. Forms shall conform to dimensions shown on the drawings. Forms shall be tied and braced so as to maintain straight, true and level position.

b. Form lumber shall be No 2 or better construction grade fir or minimum 3/4" plywood.

c. Forms shall be removed after concrete has sufficiently cured to maintain own weight.

d. No live loads will be placed on the concrete for at least 48 hours after placing.

e. A minimum 12" bullnose finish shall be required at the edges of slabs.

02300-1.3 Concrete Reinforcement

a. Place reinforcement accurately and securely positioned to prevent displacement during pouring, vibrating and finishing slab.

02300-1.4 Cast In Place Concrete

a. Cement shall conform to ASTM C 150 Type 1 or 1A Concrete design shall have 28 day compressive strength of 3,000 psi. Provide copy of batch plant design mix, including admixtures prior to placing. Provide Engineer with the truck delivery ticket with all pertinent information to verify mix is as designed.

b. Concrete shall have maximum 3" slump. Air entraining admixture shall conform to ASTM 260. Air content shall be 5 to 7 percent.

c. Tests for slump, air entrainment and strength may be made by at the discretion of the Engineer and at FAA expense. FAA is will make any concrete tests. Concrete failing slump or air entrainment tests shall be rejected. Slump test method shall conform to ASTM Standard C143. Slump tests shall be made in presence of Contractor.

f. Engineer shall inspect forms and reinforcement prior to placing concrete.

g. Protect foundation excavation to prevent rain water from entering. Do not place concrete if rain has saturated foundation footprint. Dewater footprint and assure that moisture content of earth is less than 15% prior to placement.

h. Ready–mixed concrete shall be mixed and delivered in accordance with ASTM C94. Site mixed concrete shall be approved beforehand by the Engineer. Site-mixed concrete equipment and procedures must be approved by the Engineer beforehand. Water shall be clean, free from acids, alkalis and organic material.

i. Place concrete maximum of 90 minutes after mixing began. Consolidate concrete by internal immersion vibrators operating at minimum 7000 rpm. Tapping outside of forms is allowed as an additional method of eliminating potential air bubbles along the slab edge.

j. Convey concrete to foundation forms by chute from truck or other method approved by Engineer.

k. Finish concrete to a smooth level surface by floating and troweling. Do not overwork concrete. Excessive finishing may cause future surface spalling. Round outside edge to minimum 3/4" bullnose finish.

l. Provide for retention of curing moisture for a period of minimum 3 days after placement. One coat of liquid membrane-forming compound may be used. Compound shall be Symons "Magic Coat and Seal" or other approved equal. Apply compound immediately after concrete finishing.

m. At contractor's discretion, anchor bolts may be cast in place or placed in holes drilled after concrete has cured. Epoxy or expansion bolts shall be used. Bolts, nuts and washers shall be stainless steel.

DIVISION 16000 – ELECTRICAL

Part 1 – General

16000-1.1 Scope

Contractor shall provide a complete and functional electrical service for the new towers. This includes:

a. Providing electrical service to the MALSR lights atop the new towers;

b. As necessary, rerouting and reconnecting buried electrical service conductors to the towers,

c. Grounding the tower structures.

16000-1.2 Documents

a. All electrical work shall be installed to meet or exceed the provisions of the current edition of the National Electrical Code NFPA-70; Electrical Work Interior FAA-C-1217f; Lightning Protection, Bonding, Grounding and Shielding Requirements for Facilities, FAA-Std-19e; Installation and Splicing of Underground Cables, FAA-C-139b, State and local regulations.

b. The lightning protection system shall meet the requirements of the Lightning Protection Code (NFPA 780), Underwriter's Laboratories (UL) Master Labeled System (UL 96A) and as specified herein.

Part 2 - Material

16-2.1 General

Materials and equipment must comply with contract requirements. Materials furnished by the Contractor shall be new, the standard products of manufacturers regularly engaged in the production of such materials, and of the manufacturer's latest designs that comply with the specification requirements. Wherever standards have been established by Underwriter's Laboratories, Inc., the materials shall bear the UL label.

16-2.1.1 Materials. Electrical materials shall be supplied by the Contractor as specified in the following sections.

16-2.1.2 600-Volt Power Cable. Unless otherwise noted, all power cable shall be installed in 2" underground conduit, and shall be soft drawn or annealed copper conductor, type USE, cable rated at 600 volts with cross-linked polyethylene insulation. Conductors #6 American Wire Gauge (AWG) and larger shall be stranded.

16-2.1.5 Armored or Metal-Clad Power Cables. These cables, for power service to the systems, will conform to NEMA WC-7 and UL 1569. Insulation will be cross-linked polyethylene.

16-2.1.8 Sealing of Unterminated Cables. All power and control cables left unterminated will be sealed. This specifically applies to the localizer antenna cable complement because all other cables will be terminated by the Contractor. The Contractor will wrap a layer of high voltage tape around the ends of each cable. Cover it with Scotchkote brand sealant and wrap the end in electrical tape.

16-2.2 Cable Locator Tape. Contractor shall furnish locator tape that is 2" wide and has an aluminum core. Tape shall be continuously identified by the words 'WARNING - UNDERGROUND CABLES" or other acceptable identifier. Tape shall be protected by a plastic

coating and manufacturer-approved for this type of application. Tape shall be installed above all underground cable trenches at 12" above the service conductor.

PART 3 - INSTALLATION

16-3.1 General. The rules, regulations, and reference specifications herein are minimum requirements and shall not relieve the Contractor from furnishing and installing higher grades of materials and workmanship when specified herein or required by the contract drawings. This specification shall govern any conflicts between reference documents and this specification.

16-3.2 Workmanship. All materials and equipment shall be installed in accordance with the drawings and the recommendations of the manufacturer. The installation shall be accomplished by skilled workmen regularly engaged in this type of work. Where required by local regulations, the workmen shall be properly licensed.

16-3.3 Contract Drawings. Where drawings indicate (diagrammatically or otherwise) the work intended and the functions to be performed, even though minor details are not shown, the Contractor shall furnish all equipment, material, and labor to complete the installation work and accomplish indicated functions of the electrical installation.

16-3.4 Minor Departures. Minor departures from exact dimensions shown in electrical plans may be permitted where required to avoid conflict or unnecessary difficulty in placement of a dimensioned item, provided all contract requirements are met. The Contractor shall promptly obtain approval from the Engineer prior to undertaking any such proposed departure.

16-3.5 Trench Excavation - Trench shall be hand-excavated to a depth of 2' below grade. Trench banks need not be kept vertical but may be sloped or widened to such general limits as may be set by the Site Representative, provided there is no interference with other utilities. The trench bottom shall be a minimum of 6 inches wide or as required to provide separation between power and control cables or between power cables of different voltages (See FAA Specification FAA-C-1391b Par. 3.4.11). The fill material shall be compacted to approximately the same density of the adjacent soil.

Participants

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Carl Steiger	ANI 830	425 227 1079 office 206 200 5854 cell
Christine Chesak	P&R PIM	425 203 4757 office 801 891 5028 cell

Annex A Drawings

Drawing	Number
Cover Sheet	GJT-D-MALSR11-G001
Airport Layout Drawing	GJT-D-ALD-C001
MALS Plan & Profile	DR.RM-D-302-40750-2
MG-30/MG-40 LIR Foundation Details	GJT-D-MALSR11-C003
MG-20 LIR Foundation Details	GJT-D-MALSR11-C004
Maintenance Stand	GJT-D-MALSR11-C005
LIR Structures Parts & Configuration	GJT-D-MALSR11-S001
LIR Structures Assembly Instructions	GJT-D-MALSR11-S002
Station Electrical Details	GJT-D-MALSR11-E001

GOVERNMENT FURNISHED MATERIAL (GFM)

MALSR
WALKER FIELD AIRPORT GJT
GRAND JUNCTION, COLORADO

Item	Description	Quantity
1.	13'-11" MG-20 tower, RAIL	1
2.	14'-11" MG-20 tower, RAIL	1
3.	21'-1" MG-20 tower, RAIL	1
4.	26'-11" MG-30 tower, RAIL	1
5.	31'-11" MG-40 tower, TM	1
6.	33'-11" MG-40 tower, TM	1
7.	40'-0" MG-40 towers, TM	3
8.	36'-11" MG-40 tower, TM	1
9.	35'-11" MG-40 tower, TM	1
10.	21'-1" MG-tower, TM	1
11.	T-1 crossbar & junction box, RAIL	4
12.	TM crossbar, complete	8
13.	MG-20 anchor bolt sets	4
14.	MG-30 anchor bolt sets	8
15.	Epoxy kit	1
16.	Lift device	1
17.	Jack assembly	1

Note: The LIR materials will be stored in the vicinity of the airport operating area. Contractor and Engineer will jointly inspect LIR materials for damage. After LIR materials have been accepted by Contractor for installation, Contractor will lift, load, transport and install LIR structures as required by construction documents.

Custody of the above property was accepted by Contractor. Property is in good condition except as noted below (if any):

Received by: _____ Date;_____-
Contractor's Representative

Title: _____

Installation of LIR structures for MALSR at Walker Field Airport, Grand Junction, CO

Name of Firm: _____

_____

Contract No.: _____

This document certifies that all the required work for the installation of LIR structures for MALSR is substantially complete and is ready for Contractor Acceptance Inspection (CAI). Submission of this document implies the following:

All work is complete and in compliance with the project drawings and specifications.

Components and systems are operational.

All warranties, product information and shop drawings have been assembled.

Work is clean and ready for inspection.

Changes to project drawings and specifications are completely delineated on "redlined" prints

This document does not relieve Contractor of responsibilities to correct all discrepancies that may be found on the CAI.

List Minor Deficiencies _____

_____

_____

_____

_____

_____ _____

Contractor's Signature Date